

MISSOURI

resources

Spring / Summer 2007 • Volume 24 • Number 2



Director's Comment

Do you have Show-Me Pride? A member of the Department of Natural Resources team recently traveled to another state.

While she enjoyed her trip, she said it made her appreciate Missouri a little more. The air here seemed a little cleaner. She noticed very little trash along the road as she traveled Missouri's highways. Our rivers, lakes and streams seemed a little more pristine, and our historic properties clearly receive tender loving care. We are blessed to live among so many people who take pride in Missouri's beauty. I call this Show-Me Pride.

Missourians take pride in their natural and cultural resources and it shows in our clean air, land and water, and in our abundant cultural resources. If you'd like to show your pride but aren't quite sure where to start, I encourage you to pick up our department's recently released biennial report, "The State of Missouri's Environment: 2007."

This report is an excellent road map for where we've been, where we are and where we need to go. It shows that we've made significant progress in removing pollutants from Missouri's water bodies and reducing the amount of trash making its way into Missouri's landfills. The air in Missouri's large metropolitan areas is now much safer to breathe. Our award-winning state park system and our nationally recognized historic preservation program both inject millions of dollars into our state's economy.

While a great deal has been accomplished, a great deal remains to be done. The Kansas City and St.



Louis communities are working hard to ensure they are able to meet new, stricter federal guidelines for ground-level ozone. Finding a way to deal with e-scrap is a growing problem that businesses, households and communities must face. With gas prices on the rise, it is becoming exceedingly important that we find ways to cut our energy costs. Cleanup efforts continue at Johnson's Shut-Ins State Park, and maintaining our state's historic properties requires an ongoing commitment.

If you have Show-Me Pride in the Show-Me State, I encourage you to pick up a copy of this report, which will help you determine what role you can play in these efforts. To request a free copy of the report, call the department toll-free at 1-800-361-4827, or download the report from the department's Web site at [\[www.dnr.mo.gov/pubs/pub1332.pdf\]](http://www.dnr.mo.gov/pubs/pub1332.pdf).

Together, we can show visitors to the beautiful State of Missouri our Show-Me Pride.

Doyle Childers
Missouri Department of Natural Resources

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Mission Statement

The mission of the Missouri Department of Natural Resources is to protect, preserve and enhance Missouri's natural, cultural and energy resources.

MISSOURI RESOURCES

is published three times per year by the Missouri Department of Natural Resources to inform readers about important natural resource issues and how they are being addressed. Any correspondence should be directed to the editor at the Department of Natural Resources, Publications, P. O. Box 176, Jefferson City, MO 65102-0176, or call 1-800-361-4827. E-mail address: moresdnr@dnr.mo.gov MoDNR home page: www.dnr.mo.gov

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is available in alternative formats.

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Missouri Resources is printed with soy ink on recycled paper at RR Donnelley, Liberty, Missouri.



printed on recycled paper



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by Victoria Lovejoy

Lake Taneycomo, in southwest Missouri, is well-known for its clear waters and trophy trout fishing. With the \$300 million Branson Landing snuggling up alongside, city engineers knew that protecting the lake from large-scale storm water runoff events required their best effort.

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Watching the Waters



DNR photos by Scott Myers

Above right: Early morning fog begins to lift at Lake Wappapello, in Wayne County.

Above: Soft colors and light traffic adorn the Ozark hills as seen over the top of the Table Rock Lake dam at sunset.

FRONT COVER: A seldom-traveled, rural road graces the northern Missouri county of Schuyler.

BACK COVER: Summer dreams are reflected in the waters of Long Branch Lake, near Macon.

Cover photos by Scott Myers.

Alternatives

Wastewater Systems for Small Towns

by Leland Neher
photographs by Scott Myers

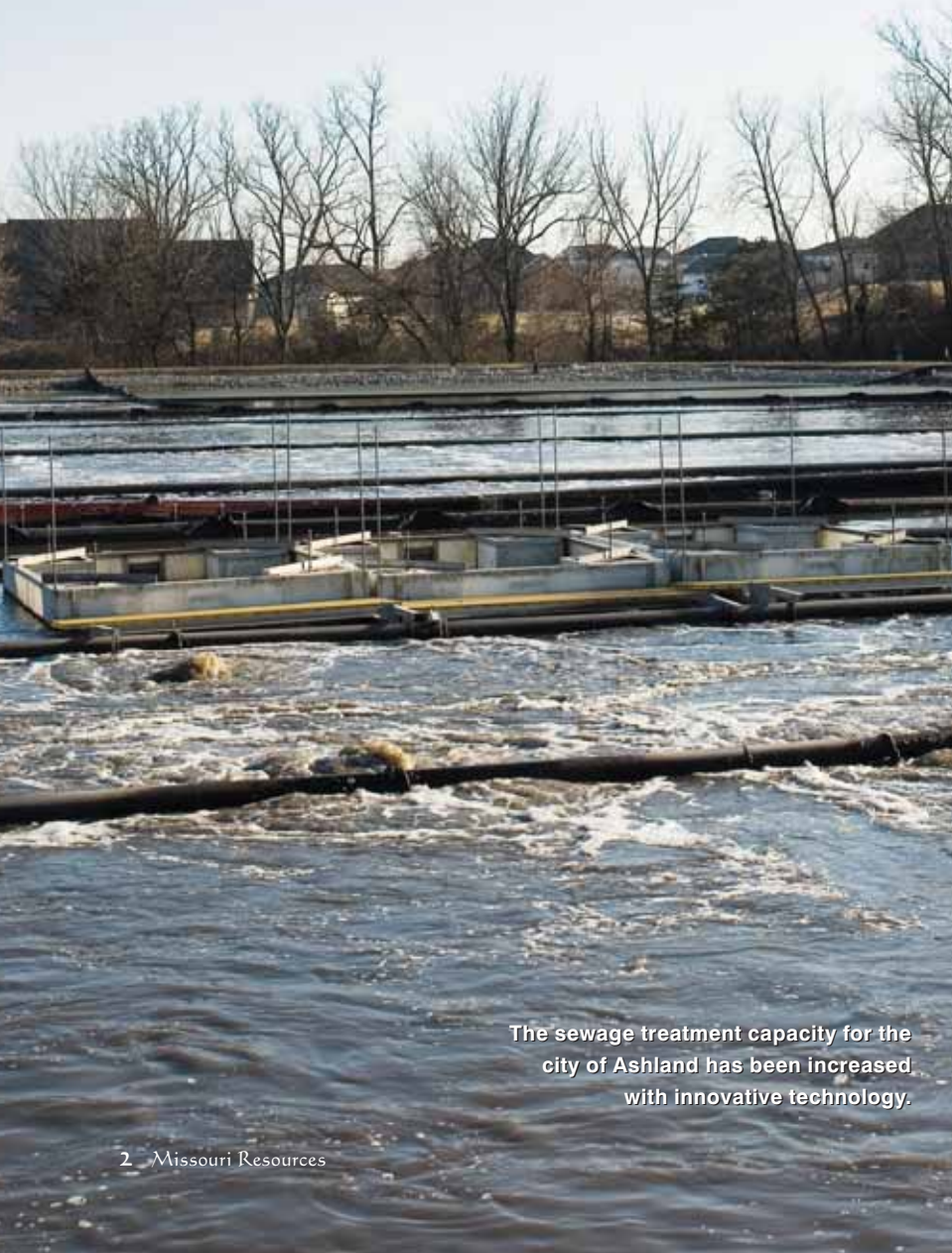


Wastewater stinks. And when left untreated, wastewater discharges kill fish and other aquatic life, spread disease among humans and animals and eliminate recreational opportunities. Historically, many small communities have constructed lagoons to treat their wastewater. Today, many small Missouri communities with limited financial resources are being hit hard by increasingly strict wastewater treatment requirements. The challenge for these communities is to meet the need for clean water at an affordable price.

In 2005, following a 2004 Coalition for the Environment vs. EPA lawsuit settlement, Missouri was required to update its water quality standards, which were several years old. The updates included several stricter standards for wastewater discharges. These stricter standards include limits on wastewater bacteria released after treatment. The new water quality standards include revised ammonia standards, which are necessary to protect freshwater aquatic life. The standards also will challenge wastewater treatment plants, especially those that discharge to small streams.

These and other new water quality standards are especially difficult for small communities to meet. For example, when upgrading systems, communities normally pass the costs of the upgrades along to their customers. Small communities with fewer customers may not be able to afford a potentially sharp increase in their sewer rates.

Many communities do not have in-house staff with the expertise to assess the community's needs, evaluate technology options and decide on a course of action to meet regulations. Usually, hiring a consultant is required, adding to the overall cost of the project.



The sewage treatment capacity for the city of Ashland has been increased with innovative technology.



These systems allow wastewater to stand quietly for several weeks to a few months. This is necessary because the combined impact of Missouri's winter temperatures and algae growth causes the natural processes to slow down, lowering their effectiveness. Additional measures may be needed to compensate for slower winter waste breakdown.

Slow-rate irrigation, involving the application of wastewater to vegetated land surfaces, may offer a natural solution. The nutrients found in the wastewater and the water itself are beneficial to a wide variety of crops, pasturelands and forests. As the wastewater infiltrates and percolates from the soil surface to the plant root zone, it is "cleaned." Meeting even the strictest effluent limits may be possible using this process.

Natural systems need little energy or technical expertise to maintain, so operating costs are low. However, the significant amounts of land they require may be expensive. Should an aerated lagoon be required as part of a treatment plant upgrade, energy costs will increase. Construction costs for natural systems can be as low as \$3 to \$6 per gallon of capacity. A treatment plant might serve a population of 1,000 for between \$300,000 and \$600,000 at that rate.

New and Improved

The second category of treatment, enhanced natural systems and filters, includes



“We can never stop looking for innovation and options to provide clean water at an affordable price.”

– Ed Galbraith
Director, Water
Protection Program

Another hurdle is that more sophisticated treatment options require a higher level of oversight by a trained operator. This becomes an added, permanent operating cost for communities. In many cases, experienced, licensed treatment operators are not available in rural areas of the state. When they are available, part-time assistance is all that the communities can afford.

Financing the cost of construction of a wastewater treatment facility is another obstacle. The State Revolving Fund provides loans to communities at interest rates that are about 30 percent of the market rate. The savings can be significant over the 20-year term of the loan.

“Without exception, all Missourians want clean water – but it comes at a price,” said Ed Galbraith, director of the department’s Water Protection Program. “We can never stop looking for innovation and options to provide clean water at an affordable price.”

Despite these challenges, options actually exist. Communities must consider the advantages and disadvantages associated with each type of system when deciding on a treatment type.

The department’s Field Services Division is taking a proactive approach by assisting small communities on these issues. “We have recently added staff to ensure that we are in the field more, helping to solve problems,” said Jim Macy, the division’s director.

The Natural Solution

The first category of treatment is natural systems such as lagoons and wetlands. These use the natural processes found in ponds and wetlands to break down sewage.

(Top) City of Sturgeon Maintenance Superintendent Gary Lear and Mayor Paul Heywood are pleased with the wetlands and overland flow system that improve the operation of the community’s traditional lagoon sewage treatment facility. (Left) A recirculating pea gravel filter at the Sunny Slopes sewage treatment plant in Camden County – on the shore of the Lake of the Ozarks.



Adding enhancements to a conventional lagoon helped the central Missouri community of Ashland to better serve its residents. Because of its location between Jefferson City and Columbia, Ashland has experienced unprecedented growth, leading to the need to increase the capacity of their sewage treatment facility. The city, in partnership with Environmental Dynamics Inc. of Columbia, increased the capacity of their lagoon system from 165,000 gallons per day to 290,000 gallons per day by trying new and innovative technology.

Lagoon enhancements in Ashland have helped the community keep pace with the sewage treatment demands of a growing population.

natural systems with additional treatment steps. Filters that allow “waste-eating” bacteria to grow on their surfaces to remove contaminants from the water or to physically remove particles are included in this category. These filters may be placed to assist lagoons, or used as an alternative to lagoons.

The simplest way to increase lagoon treatment effectiveness could be the use of a controlled discharge lagoon. In contrast to traditional lagoons, where the flow into and out of the lagoon is constant, controlled discharge systems retain wastewater in the lagoon throughout the cold weather season to allow more time for the natural cleaning processes to occur.

The treatment effectiveness of lagoons also can be enhanced with the placement of sand filters or filtration by natural vegetation such as common turf grass, called overland flow. These are placed downstream of the lagoon. Overland flow has been employed in the north central Missouri town of Sturgeon, a community of less than 1,000 residents. The City of Sturgeon added wetlands and an overland flow system to their lagoons many years ago. Extensive testing by the city and the University of Missouri showed that the addition of the wetlands and overland flow improves the quality of the discharge equal to that of a mechanical treatment plant. Unlike a mechanical plant, Sturgeon’s system only requires about two hours a week of attention, according to Gary Lear, Sturgeon’s maintenance supervisor.

Not only have the lagoon enhancements allowed them to increase capacity by 75 percent, the effluent quality is equal to that expected from a mechanical plant. Because of this success, John Fraga, Public Works Director for the city of Ashland, says the city is planning to add more of the same new technology to their lagoon system to nearly double its capacity to 500,000 gallons per day. Fraga also says that the system is really a “hands off” type system because they only have to provide about two hours per week in maintenance.

Pea gravel or artificial media filters made from textiles, foam rubber or synthetic fibers can all be utilized to increase treatment efficiency to meet the new, stricter standards. In 1991, Arno Wehr constructed the first recirculating pea gravel filter in Missouri using modern design concepts to serve his Tribesman Resort located on Table Rock Lake.

Wehr has given many tours of his facility over the years and has always demonstrated that the effluent is clear, odorless and has the appearance of plain water. Wehr reports that the majority of his operation and maintenance costs are for testing of the effluent and disinfecting chemicals. “I only need two hours of labor per week and have spent only \$1,000 over the life of the system on parts,” said Wehr.

A final enhanced natural system option, drip irrigation, similar to slow rate irrigation, delivers treated wastewater under the

soil surface at a metered rate. Again, the soil serves to “clean” the discharge stream. Since the delivery rate is monitored, it may be adjusted to avoid the formation of “ponds” on the soil surface.

As with the natural treatment systems, the enhanced systems are typically land intensive. Submerged media systems and pea gravel filters, such as those in Raymondville, Morrisville and Halfway, are the only options in this category that do not require significant amounts of land.

All of these sewage treatment systems require more money to build and cost more to operate and maintain than the natural systems. Most likely, these systems will require approximately four to 12 hours of an operator’s attention each week. Energy costs are similar to natural systems. Aerated lagoon and drip irrigation systems have higher costs. Construction costs for these systems can vary considerably from \$5 to \$15 per gallon of capacity, depending on specific site requirements, cost of the mechanical equipment, land needs and the number of pollutants that the system is required to remove.

In the Big City

The final group of treatment options is “activated sludge” processes. These typically are operated in larger cities where the customer base is big enough to hire a full-time operator to run the wastewater plant. Usually, a city requires a population of 1,000 or more before they can hire a full-time operator. The mechanical plants are usually capable of being very efficient and produce high quality water, but only when they have a budget that will provide for a highly skilled operator, repair parts and extensive operation testing.

Construction costs for activated sludge plants are competitive with the enhanced systems and filters. Land needs are minimal. However, operating costs will likely amount to thousands of dollars each month for labor, off site laboratory testing, parts and electricity.

Decisions, Decisions

Small communities will be facing tough challenges in the near future when deciding how to treat their wastewater. The department’s Division of Environmental Quality Director Dan Schuette notes the difficult



but critical balance. “Ensuring water quality poses technological as well as financial challenges. Through innovative technologies, we have the opportunity to address both at once.”

In order to arrive at the best solution for a particular community, the annual operating costs, including electricity and oversight, should be carefully considered. Just looking at the construction costs of a project does not always tell the full story. For more information about these technologies, contact the department’s Water Protection Program directly at (573) 751-1300 or visit the Web at [www.dnr.mo.gov/pubs/pub2210.pdf]. State Revolving Fund loan information is also on the Web at [www.dnr.mo.gov/env/wpp/srf/index.html]. ☀

Leland Neher is an environmental engineer in the Water Protection Program’s Financial Assistance Center.

Dave Krehbiel, Krehbiel Engineering, Camden-ton, and Jennifer Eblen, Camden County wastewater department, examine the re-circulating pea gravel filter at the Sunny Slopes sewage treatment plant.

Wow'd in Kansas

by Dawn Fredrickson



DNR photos by Scott Myers

Mountains of sleeping bags, tents and overnight gear began appearing as a group of 50 grade school students swarmed over the clearing, voices shrill with anticipation. Fred Hicks, safety officer for the Missouri Department of Natural Resources, temporarily assuming the duties of “drill sergeant,” hollered for attention and issued instructions. Organizing the students into smaller groups, Hicks had them remove twigs, acorns and leaves in preparation for pitching their tents. Laughing while frantically shuffling their feet through the leaves to create space for their tents, the students were given their first lessons on how to set up camp. Thus began Kansas City’s first annual WOW National Recreation and Conservation School, at Swope Park, on the auspicious day of Friday, Oct. 13, 2006.

City

WOW is a traveling outdoor school designed to teach participants how to enjoy a wide range of outdoor recreation activities while practicing personal safety and outdoor responsibility. Outdoor courses are provided for both the beginner seeking first-time exposure to the natural world and to the seasoned outdoorsman looking to brush up on specific skills. Sponsors of WOW include the Missouri Department of Natural Resources, Bass Pro Shops, the Wonders of Wildlife National Museum and Zooquarium in Springfield. Other sponsors include the Missouri Department of Conservation, the National Park Service, the National Forest Service and the U.S. Army Corps of Engineers.



DNR photo by Scott Myers



DNR photo by Dawn Frederickson

The first WOW National Recreation and Conservation School was offered in Springfield in 1997. The second WOW school was at Roaring River State Park near Cassville in 1998 and has been offered there every year since. Wanting to bring the outdoor school to urban residents who might not otherwise have the chance to learn outdoor skills, the department began looking for opportunities to host the school in the St. Louis and Kansas City metropolitan areas.

In 2003, the first WOW St. Louis was hosted at Dr. Edmund A. Babler Memorial State Park near Wildwood. Each year since, it has been held at Forest Park, in cooperation with the St. Louis Department of Parks, Recreation and Forestry and Gateway Bank of St. Louis.

This past year, 2006, marked the first year the outdoor school was offered in the Kansas City metropolitan region. Looking for a suitable location in Kansas City, the WOW sponsors approached the Kansas City, Mo., Department of Parks and Recreation, who agreed to help sponsor the event. Swope Park, 1,805 acres of largely forested

area, centrally located, seemed the perfect site for hosting WOW Kansas City, according to Marci Jones, superintendent of the South Parks Region for the Kansas City Department of Parks and Recreation. "Swope Park was donated to the city in the late 1800s to be used and enjoyed by everyone and it has been great to see families coming back and camping in the park," affirmed Jones. "It's been incredible to partner with the departments of Natural Resources and Conservation to serve area youth and their families. I loved seeing the children have experiences in the middle of the city that they probably never thought were possible."

As with WOW Roaring River and WOW St. Louis, WOW Kansas City provided a wide range of activities from which participants could choose, including archery, rock climbing, family fishing, fire starting, building bird houses, bird-watching and urban hiking. One of the more unusual classes was carving fish hooks out of animal bone. Classes took place at Lakeside Nature Center, located within Swope Park and operated by the Kansas City Parks and Recreation Department, and at James A.

(Opposite page) Greer Barlow, Kansas City, conquers the climbing tower and then sharpens her eye at the archery range.

(Top) Sungwen Hwang pets an opossum.

(Above) WOW participants set up camp.



(Above) Tim Miller, right, a Missouri Department of Conservation archery instructor, talks to, from left, Matthew Browning, Bala Browning, Nadja Karpilow and Anja Browning.

Reed Conservation Area. Classes were also offered at the Discovery Center in Kansas City, operated by the Missouri Department of Conservation and used by both the Conservation Department and the Department of Natural Resources to provide urban outreach services. Nature center staff and staff from the departments of Conservation and Natural Resources, as well as staff from the Kansas National Guard, acted as instructors for the various classes.

Participants were also given the chance to camp overnight at Camp Lake of the Woods within Swope Park. Nighttime temperatures near freezing didn't scare off the 80 or so participants who chose to pitch their tents. For many, this was their first time camping, cooking supper over a fire and roasting marshmallows to make that all-time campfire favorite, s'mores. The WOW school provided tents to those participants without one and WOW staff were on hand to assist with pitching them.

Nicole King, principal of Scuola Vita Nuova, took advantage of the several large group tents available for use and brought her entire third-, fourth- and fifth-grade classes for their first overnight adventure in the outdoors.

Scuola Vita Nuova, Italian for School of New Life, is a charter school in northeast Kansas City, serving students from kindergarten to eighth grade who are considered at-risk academically. King saw WOW Kansas City as a practical way of supplementing the environmental curriculum

being established at the school and was excited at the opportunity to use WOW as an initial exposure to nature for her students. "For some of our kids from the urban core, this is the first camping experience they've ever had. Last night's activity of putting up tents taught them teamwork and planning," she said. King plans on using the experiences learned at Kansas City WOW as a foundation to implement other outdoor adventures for her students, such as float trips, caving trips and overnight backpacking trips.

Larry Larson, coordinator for the WOW Kansas City event and Katy Trail State Park Coordinator for the Department of Natural Resources, echoed King's sentiment.

"We're really aiming this event at folks who've never had the opportunity to visit state parks or conservation areas, those folks who don't feel comfortable in the woods or who've never had the opportunity to learn outdoor skills or participate in outdoor activities," Larson said. He cited two factors for successfully achieving their goal of providing outdoor opportunities to urban residents: continuing the partnership with the various WOW sponsors and entering a new partnership with the Kansas City Parks and Recreation Department to offer WOW at Swope Park.

Larry Long, a resident of Richmond who participated with his daughter Carriellee and son Jacob, agreed. "The state of Missouri does an outstanding job with outdoor education. The average citizen doesn't really know the difference between all the state agencies, so it's great to be able to come to a Department of Conservation facility and be offered activities by the Department of Natural Resources. "We're really lucky to have two state agencies take such good care of our resources and offer us places to go and things to do," Long said.

Capturing the attention of some of the students from Scuola Vita Nuova long enough to ask them how they were enjoying WOW Kansas City was difficult, as they excitedly raced from class to class. Pablo Lopez and Aldrin Valdez did stop long enough, before heading off to the archery class for a second time, to agree that, yes,



DNR photo by Scott Myers

(Left) Nicole King, principal of Scuola Vita Nuova with her students.

(Below) Larry and Carrielle Long, of Richmond, make bone fish hooks.

(Bottom) Theresa Ramsey, naturalist at Knob Knoster State Park, talks about owls to an attentive audience.



DNR photo by Scott Myers

they were having a blast and, yes, they wanted to do this again.

“Hopefully this experience will instill in them a love for the outdoors and will encourage them to continue going outdoors,” King said. “These kids will be ambassadors by going back to their parents and being excited about what they did and where they went. Plus, they’ll go home and sleep really well tonight,” she laughed.

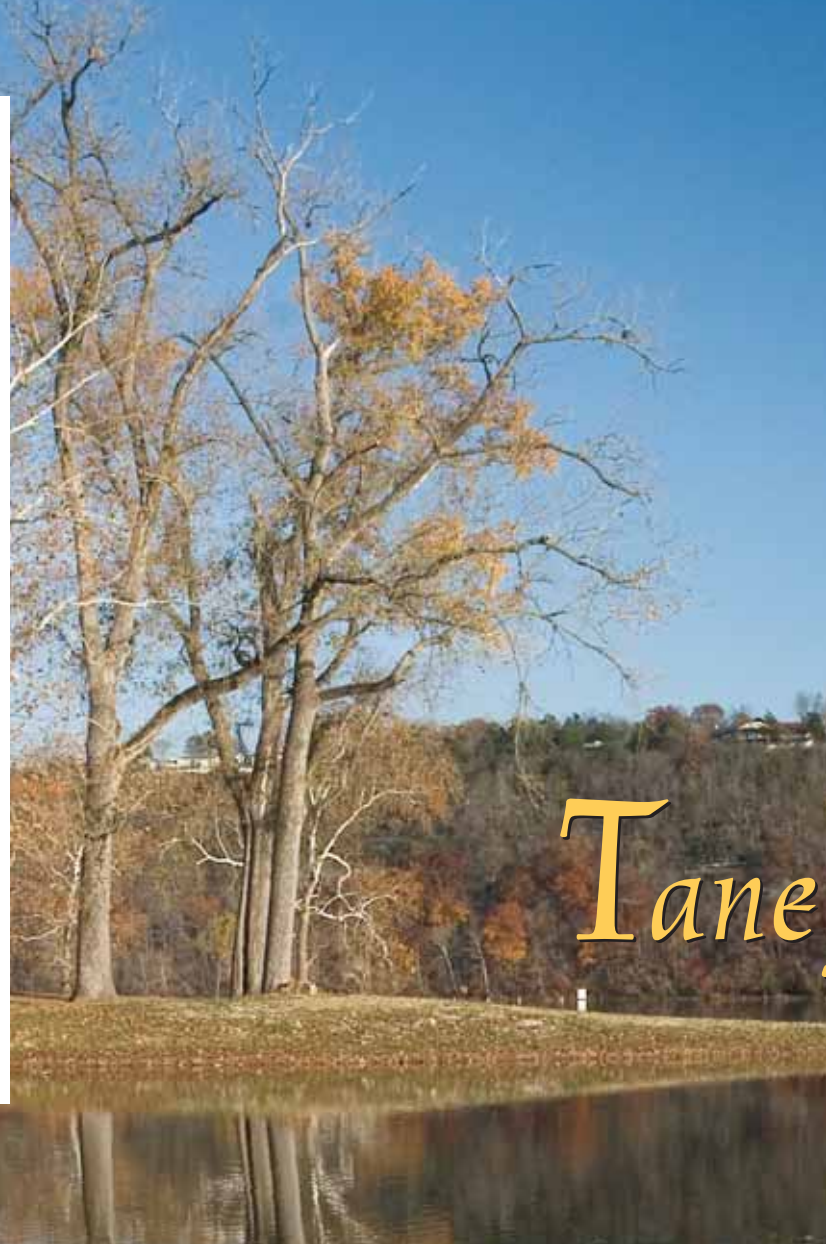
For more information about the WOW National Recreation and Conservation School, to register to attend WOW St. Louis, WOW Roaring River or WOW Kansas City, or for information about other events, contact the Department of Natural Resources toll free at 1-800-334-6946 (voice) or 1-800-379-2419 (Telecommunications Device for the Deaf) or visit [www.mostateparks.com]. Information can also be requested by e-mail at moparks@dnr.mo.gov. WOW St. Louis will be held June 9, 2007, at Forest Park; WOW Kansas City will be held Sept. 21 and 22, 2007, at Swope Park; and WOW Roaring River will be held Oct. 6-7, 2007, at Roaring River State Park.

Come and be WOW’d! 🌞

Dawn Fredrickson is planning section chief for the Department of Natural Resources’ Division of State Parks.



DNR photo by Scott Myers



Tane





DNR photos by Scott Myers

Taneycomo's Pollution Solution

by Victoria Lovejoy

Storms can bring needed rain. We have all heard the saying, "April showers bring May flowers." But rain can create more than pretty posies. Storm water runoff occurs when rain or snowmelt moves over the ground, picking up natural and human-made pollutants as it travels along.

This runoff, called non-point source pollution, is a major threat to water quality, leaving some rivers and lakes unable to meet the criteria for safe swimming and fishing. Unfortunately, it is also quite difficult to curtail.

Picture waves of dirty brown water shimmering with oil. This filthy water is carrying soggy cigarette butts and scraps of trash while rolling down streets and hills toward the lake where you fish or swim. Now bring to mind that same rush of murky water being diverted into drains that take the water into an underground system. This system filters that water and leaves it free from all of those pollutants. If you were planning a city or development, which would you prefer for your town?

The Branson city engineers chose the second option for their newly developed Branson Landing. Branson Landing is an outdoor mall with more than 100 shops and restaurants situated right on the shore of Lake Taneycomo.

Lake Taneycomo serves as the centerpiece of the Branson area, enjoys high water clarity and is important as a cold water trophy trout fishery. Lake Taneycomo is also the perfect backdrop and setting for the town's \$300 million Branson Landing, "America's Newest Riverwalk."

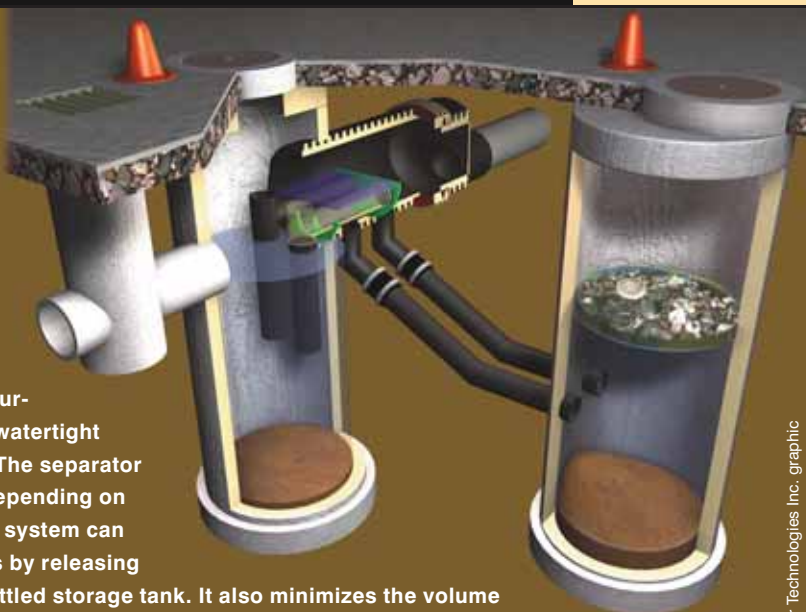
As the engineers discussed development plans, they decided the best choice was to install enough filtration systems to filter the storm water runoff from the entire historic downtown area, not just the proposed Branson Landing.

HCW, LLC., a development company based in Branson, and the City of Branson worked together to install the BaySaver Storm Water Separation System. This system has the ability to treat the storm water runoff before the storm water can flow into Lake Taneycomo.

(Opposite page) An aerial view of the dynamic Branson strip. (Opposite page, bottom) Trout fishermen work Lake Taneycomo. (Background photo) Lake Taneycomo at Empire Park. (Above) Lake Taneycomo encircles Edgewater Beach, Ozark Beach and Empire Park near the dam at Powersite.

How it Works

This graphic illustrates one of the three BaySaver filtration systems that front Lake Taneycomo at Branson Landing. Utilizing gravity and density variation, “floatable” materials, oils and sediment pollution are captured during runoff and retained in the watertight storage manhole (right side). The separator unit directs incoming runoff depending on the level of contaminants. The system can adjust to high-intensity storms by releasing the cleanest water from the settled storage tank. It also minimizes the volume of water that must be removed during maintenance, reducing disposal costs.



“The quality of the water coming out of the BaySaver filtration system far exceeds our expectations,” said David Miller, Branson City Engineer. “It works much better than we thought it would. The muddy water goes into the filtration system and comes out looking just like the lake water.”

Installation of the BaySaver filtration system is a huge step forward in non-point source pollution prevention. The system, consisting of three stations, is the first of its kind in the state. It operates by using gravity flow and density differences to remove 80 percent of runoff

pollutants, helping to clean the water that enters Lake Taneycomo (see graphic, left).

The storm water filtering system is designed to treat storm water runoff during an entire storm – not just the initial “first flush.” The system matches the treatment flow rate to the incoming flow rate. It is composed of two standard manholes and a separation unit. The manholes permit the storage and subsequent removal of pollutants. The separator unit directs the water flow, providing efficient treatment. Miller said the system is routinely cleaned when it accumulates debris and oil.

Now, the future of Branson, the Branson Landing and the waters at Lake Taneycomo look much clearer, thanks to the installation of the storm water separation system. The City of Branson funded the infrastructure improvements, including the storm sewer system and water quality units. The filtration stations were completed in mid-November 2005 and began operation at the end of January 2006.

Miller said they are happy they installed the system.

“One day I was following someone in traffic and saw the driver toss out a cigarette butt,” he said. “I was relieved to think that the BaySaver system would catch that cigarette and keep it from getting into our lake.”

Developers of the Branson Landing say they drew inspiration for the Branson Landing Project from the area’s “picturesque wa-



DNR photos by Dan Leyland

Engineers and contractors install the BaySaver stormwater filtration system.

terfront setting.” The landing includes 1.5 miles of waterfront. Branson Landing opened in 2006 and more than 4.5 million visitors are expected to visit the Landing each year. The Landing will be home to a 220,000 square foot convention center, nearly 450,000 square feet of retail shopping, more than 350 hotel rooms, 140 waterfront luxury condominiums and a marina.

Between the thrilling water show, shopping, hotel and condos, the expectation is that traffic will increase as more people continue to flow into the area. Providing a filtration system that filters pollutants and controls storm water runoff is even more valuable now for the preservation of water quality at Lake Taneycomo.

“The water in Lake Taneycomo has so many beneficial uses, such as supporting aquatic life, providing a public drinking water supply, recreation and swimming,” said Dan Leyland, an environmental specialist with the Missouri Department of Natural Resources. “This is a unique part of the watershed in the Branson area.”

Lake Taneycomo is definitely a unique water body. The lake is classified for boating, livestock watering, aquatic life, public drinking water supply, whole body contact recreational use and as a cold water fishery.

Fish are important in the Lake Taneycomo area. Trophy trout are caught near the Shepherd of the Hills Fish Hatchery. The fish hatchery has another distinction as well. Branson Landing was not the first place in the Branson lake area to install a high-tech filtration system. In 2002, Trout Unlimited took the first step towards parking lot storm water filtration at the Shepherd of the Hills Fish Hatchery, Missouri’s largest cold-water facility for raising rainbow and brown trout.

Visitors can view trout eye-to-eye in the visitor center aquarium. Exhibits describe trout spawning, egg development and fish rearing. A 10-minute, introductory slide show explains the spawning process and care of the trout.

The Branson Chapter of Trout Unlimited, with the help of the Missouri Department of Conservation, secured grant funding to create the storm water pollution control system, which treats the runoff from the fish hatchery’s asphalt parking lot. The parking lot previously dumped storm water runoff directly into the trophy trout area of Lake Taneycomo. Now, a sand filter system is utilized that is capable of removing 75 to 80 percent



DNR photo by Scott Myers

of pollutants and helps protect the water quality in Lake Taneycomo. The filtration system is an excellent conservation project for the preservation of cold water fisheries, not only for this watershed, but nationwide.

Since Lake Taneycomo is a cold water fishery, keeping the water at a cooler temperature becomes even more important. Fish kills have occurred when simmering runoff from sun-heated pavements enter a lake or stream. A storm water filtration system such as the BaySaver Filtration System includes retention basins that collect and hold the water, allowing it to cool before entering the lake.

The Department of Natural Resources is pleased by the installation of a storm water filtration system in Branson and at the fish hatchery. Installation of these systems is in step with the department’s guiding principle of using the best control technologies for non-point pollution discharges at Lake Taneycomo.

Perhaps other developers in the watershed will see the benefits obtained at Branson Landing or the fish hatchery and proactively install pollution controls. More than \$3.1 billion is dedicated to future construction in Branson. This leaves plenty of opportunity, and hope, for installation of more filtration systems. 🌅

The waterfront face of Branson is changing with the ongoing construction of Branson Landing.

Victoria Lovejoy is a public information specialist for the department’s Southwest Regional Office.



State of The Environment Report Released

A biennial report recently released by the Missouri Department of Natural Resources takes a detailed look at progress that has been made in protecting Missouri's environment, as well as the work that remains to be done.

The State of Missouri's Environment: 2007 examines ongoing efforts to protect Missouri's lakes and streams.

The SOE also tracks the progress made to protect Missouri's land, such as the recently reinstated tire fee. To date, more than 14 million tires from more than 600 dumps have been removed via the fee.

The report looks at how recent developments in energy and energy prices are affecting Missouri's economy. Nearly 94 percent of Missouri's primary energy sources are imported from outside the state at a cost of more than \$13 billion annually. Interest in harnessing wind and solar power is growing and Missouri ethanol production is expanding.

One section shows how the Parks, Soils and Water Sales Tax has been used to make important improvements to Missouri's state parks and to protect soil and water quality.

Also detailed is the significant economic impact of the state's historic preservation efforts. Since inception of the state historic rehabilitation tax credit in 1998, more than \$2.35 billion has been invested in Missouri rehabilitation projects.

The State of Missouri's Environment: 2007 describes the effectiveness of the department's efforts to improve customer service, including the addition of several new satellite offices, creation of a Field Services Division and a new ombudsman program.

To request a free copy of the report, call the department toll-free at 1-800-361-4827, or download the report from the department's Web site at www.dnr.mo.gov/pubs/pub1332.pdf.

Stream Team Data Support Clean River

The Missouri Clean Water Commission has proposed adding five waters to the 2004/2006

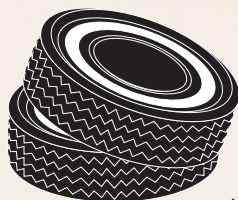
303(d) list due to high levels of bacteria. The 303(d) list helps state and federal agencies keep track of waters that are not meeting water quality standards. One of those waters, the Spring River in Jasper County, was added due to the efforts of Stream Team 2416 from Carthage High School.

In 2005, tests performed by the stream team noted high counts of bacteria in a tributary of the Spring River. Next the stream team worked with the department's Southwest Regional Office, who over the next year performed additional monitoring.

There are approximately 3,200 stream teams statewide. For information about the Stream Team Program, visit www.mostreamteam.org.

In addition to Spring River, the commission proposed adding four streams in Newton County in response to data received during the comment period.

Scrap Tires Aid Water Treatment



Contractors may now use tire chips in on-site wastewater treatment systems, due to joint efforts of the

Missouri Department of Natural Resources, the Missouri Department of Health and Senior Services, and the Missouri Clean Water Commission.

Until now, gravel or crushed-stone aggregate has been used to act as a filter in treatment systems, allowing microbes to handle potentially harmful chemicals and organisms found in residential wastewater. Tire chips, sized between one-half-inch and four inches, may now act as replacement for the traditional aggregate.



Several scrap tire processors can supply tire chips to meet the required specifications. For questions about tire chips or suppliers, contact the Missouri Department of Natural Resources at (573) 526-3909 or toll-free at 1-800-361-4827.

All of the requirements are detailed in the Department of Natural Resources' fact sheet Standards for the Use of Tire Chips in On-Site Wastewater Treatment Systems. The fact sheet is available on the Web at www.dnr.mo.gov/pubs/pub2205.pdf.



Missouri River Relief Cleanups

Columbia-based Missouri River Relief has announced its 2007 schedule of river cleanups, with events stretching from South Dakota to St. Louis.

As *Missouri Resources* went to press, several cleanup events had already been held in Kansas City, Glasgow and St. Charles, but many more are scheduled through October, including participation by River Relief volunteers in the annual National River Clean-up Day in Yankton S.D. on May 19.

More cleanup events are also scheduled on:

- June 23 – Summer Cleanup at the Mouth of the Osage, Bonnota Mill.
- July 14 – Mississippi River Cleanup with Living Lands and Waters, St. Louis.
- Sept. 22 – Cleanups in Omaha, Neb., and Council Bluffs, Iowa.
- Oct. 5-6 – Kansas City Cleanup and Learning Festival in Kansas City.

Since its founding in 2000, the organization has sponsored 25 river cleanup events and boasts the removal of more than 340 tons of trash, including 1,000 tires, 500 appliances and six bowling balls from the Missouri River.

For more information on these events, check the Missouri River Relief Web site: at www.riverrelief.org.



Natural Areas Program Celebrates Anniversary

**30
years**

This year marks the 30th anniversary of the Missouri

Natural Areas Program and visitors are urged to celebrate by exploring Missouri's diverse natural heritage in state parks and historic sites.

The Missouri Natural Areas Committee was formed on April 20, 1977, by a joint agreement between the Missouri Department of Natural Resources and the Missouri Department of Conservation. The goal of the committee and the program was to coordinate the classification, inventory, designation and stewardship of Missouri's most outstanding natural features. Over the last 30 years, the committee has designated 180 natural areas in 74 counties.

In addition to designating the state's most outstanding natural features, the Missouri Natural Areas Program is an outstanding example of intergovernmental cooperation. In conjunction with the departments of Natural Resources and Conservation, the U.S. Forest Service, National Park Service, the U.S. Fish and Wildlife Service and The Nature Conservancy have successfully worked toward a common goal. Natural areas are owned by state and federal agencies, conservation organizations, local governments, corporations, private citizens, foundations and other ownership associations.

For more information about state parks and upcoming events, visit [\[www.mostateparks.com\]](http://www.mostateparks.com).

Big, Old Tire Dump Cleaned Up

The Missouri Department of Natural Resources has announced that the Bishop Scrap Tire Site, in Cass County, is cleaned up. The 30-year-old site was the largest remaining tire dump in the state. The cleanup began May 2006.

Most of the 800,000 tires were removed from the site by TRI-Rinse of St. Louis. Those tires were shredded for use as replacement for a gravel

leachate collection layer in a landfill. Leachate is moisture that has seeped through waste. The layer of shredded tires will act as a filter to keep waste out of the leachate so that it can be safely collected for treatment. Missouri Vocational Enterprises removed the remaining tires, which will be used as tire-derived fuel in a power plant.

For more information on other solid waste issues, please contact the

department's Solid Waste Management Program at (573) 751-5401.

Turkey Farmers Win Environmental Award

A McDonald County family, whose farm has served as a Department of Natural Resources



environmental notes

Flushing Drugs Won't Stop Environmental Side Effects



It is usually illegal and definitely not recommended that medications be recycled. For the past five to 10 years, scientists with the U.S. Geological Survey and the U.S. Environmental Protection Agency have been studying the impacts of pharmaceuticals and personal care products on water resources and the living things that inhabit them. So far, they have learned that these various antibiotics, hormones, steroids and other chemicals found in medicines, cosmetics, shampoos and cleansers show up in very small amounts, and current water testing methods can't easily detect them. Certain types of these "emerging contaminants" have been affecting some species of fish and amphibians. Rather than create unfounded panic or jump to

conclusions based on incomplete data, the scientific community is treating these manifestations as warnings. Certain chemical combinations are being targeted for study. Just to be safe, some states are raising consumer awareness about the risks of careless disposal of unused medicines and personal care products.

A new outreach program aimed at encouraging southern California residents to properly dispose of their unused and expired medications was launched in early 2006. The campaign, "No Drugs Down the Drain," discourages people from flushing medications down the toilet. Flushed medications can find their way into the environment since wastewater treatment facilities are not designed to remove chemicals in the pills. More information can be found at [\[www.nodrugsdownthedrain.org/\]](http://www.nodrugsdownthedrain.org/).

The Minnesota Office of Environmental Assistance suggests that medicines be kept in their original containers. Solid medications should be mixed with enough water to partially dissolve them. Liquids should be mixed with salt, flour, charcoal or spice to discourage animals or children from eating them. The containers, also medicines in blister packs, should then be sealed with duct tape, placed in a non-transparent container and thrown into the garbage. A safer solution may be to organize community collections or see if local household hazardous waste collections will accept these potentially dangerous materials.

For more information, check out the EPA Web site at [\[www.epa.gov/nerlesd1/chemistry/pharma/faq.htm\]](http://www.epa.gov/nerlesd1/chemistry/pharma/faq.htm). In Missouri, the Department of Natural Resources has a fact sheet on drug waste at [\[www.dnr.mo.gov/pubs/pub2128.pdf\]](http://www.dnr.mo.gov/pubs/pub2128.pdf) and a publication on pollution prevention at [\[www.dnr.mo.gov/pubs/pub607.pdf\]](http://www.dnr.mo.gov/pubs/pub607.pdf). The Missouri Department of Health and Senior Services site at [\[www.dhss.mo.gov/Lab/Chemistry/WaterAnalysis.html\]](http://www.dhss.mo.gov/Lab/Chemistry/WaterAnalysis.html) offers information on water analysis.

demonstration site using turkey litter as a heating fuel source, have been presented with the U.S. Poultry & Egg Association Family Farm Environmental Excellence Award.

Joe and Pauline Brisco, Anderson, who raise more than 65,000 turkeys annually, started using a litter-burning furnace as part of a three-year, on-farm demonstration project to determine the feasibility and impact of using litter as a fuel source.

By careful nutrient management, the Briscos have been able to increase the productivity of their farmland while at the same time protecting their farm's water resources.

In 2006, the Briscos placed second in the competition for the eight-state region that includes Missouri.

Online Manuals Help Explain Regulation Process

Businesses and local governments responsible for ensuring that their operations comply with state and federal environmental requirements have new tools to help them: the same how-to manuals used by regulators as they write permits and perform inspections and investigations.

The Water Pollution Control Permits Manual is a tool for department staff writing permits under the Missouri Clean Water Law. It is intended to ensure consistency among permitting offices.



The manual is available online at [www.dnr.mo.gov/env/wpp/permits/manual/index.html] to assist those seeking permits or working to comply with department regulations. This guide will serve as a starting point to find basic information and other resources. Links and contact information for other agencies can be found throughout the guide.

The department's Field Services Division also is in the process of making its operations manual available on the department's Web site at [www.dnr.mo.gov/services/opsmanual.htm]. This manual provides current information on the department's environmental assistance visits, site inspections, complaint investigations and other division procedures.

In years past, *Missouri Resources* contained features highlighting various historic sites and landmarks throughout the state. The articles are sorely missed. They offered insight and interest to a vast number of people who may not be aware of Missouri's rich history, otherwise.

I encourage you to reinstate the history features – they would be greatly appreciated.

Betty Parks Eubank
Lee's Summit

Editor's Note:

The department manages 83 state parks and historic sites, 34 of which are state historic sites. We attempt to rotate "Resources to Explore" features between state parks and historic sites as much as possible. Some recent issues featuring historic sites include Fall '03, Fall '04, and Spring/Summer '05. To request copies of these back issues, as available, contact us toll-free at 1-800-361-4827. Two historic sites will be featured in our Fall 2007 issue, and another is scheduled for Spring/Summer 2008.

I was pleased to see the article on light pollution in your magazine – Winter 2007 issue, page 15. It is past time that Missouri recognizes what it is doing to the environment by over lighting many places in the state. As a resident of St. Louis, I have had to take action by buying property in New Mexico to observe the sky. New Mexico has lighting laws (that) allow people to reasonably light things, but not use fixtures that spew light all over their neighbors and the night sky in general. This is one pollution issue where we can save

money by properly shielding lighting (and not lighting unnecessarily), everything at night. Thus, curing the problem is cheaper than keeping it. It also saves fossil fuels and reduces acid rain pollution by reducing the need for electrical energy.

Once you see what the sky is supposed to look like, perhaps you will understand the bumper sticker on my car: "I Would Rather See Starlight Than Street Lights."

Thank you for the light pollution article. I hope that it gets people thinking.

John R. Ducheck, Ph.D.
St. Louis

You've produced another great issue and I especially want to commend you for bringing greater awareness about light pollution and its deleterious effects on the environment. Not only does it destroy one of the greatest natural beauties, but numerous studies have shown its bad effects on wildlife. The energy wasted on nighttime illumination could well be spent on other areas and the air and water pollution resulting from generating that wasted power are truly wasted.

James Row
Wentzville

Editor's Note:

We received many e-mails on the topic of light pollution, and admit to having looked up "deleterious" in the dictionary.

LETTERS



Letters intended for publication should be addressed to "Letters," *Missouri Resources*, P.O. Box 176, Jefferson City, MO 65102-0176 or faxed to (573) 522-6262, attention: "Letters." Please include your name, address and daytime phone number. Space may require us to edit your letter. You also can e-mail *Missouri Resources* staff at moresdnr@dnr.mo.gov ✉

Regulated businesses and facilities may find the department's procedures and checklists helpful for developing their own internal inspections and procedures.

Permit Forms Now Online

The Missouri Department of Natural Resources recently began making permit, license and certification forms available for use in Microsoft Word, Microsoft Works, Open Office and other word processing software. This change enables businesses to complete these forms electronically and save them to be updated for future submissions.

The forms are protected so their integrity isn't compromised, while still allowing customers to type in the fields and save the file for finishing on a later date. When customers are done filling out the form, they can print and mail the form to the Department of Natural Resources, or can sign the form and e-mail it to the department.

Check the department's Web site regularly at [www.dnr.mo.gov/forms/] to see if forms have been updated.

Statewide Water Trail Would Be Nation's Longest



Work continues on the information campaign on the Missouri River water trail, named in honor of famed explorers Meriwether Lewis and William Clark.

Last fall, Gov. Matt Blunt directed the Missouri departments of Natural Resources, Conservation and the Division of Tourism to develop an information campaign for Missourians and state visitors. River access points and the locations of campsites, bed and breakfast establishments, points of historic or natural interest and outfitters will soon be available through an Internet site and printed materials.

"This will tap into the growing nature and adventure tourism trade by encour-

aging and facilitating the use of the Missouri River by canoeists and kayakers," Blunt said.

At 500 miles, the Lewis and Clark Water Trail would be the nation's longest river water trail. The water trail could emulate the tourism and economic success of Katy Trail State Park. With more than 150 miles of Katy Trail State Park's 225 miles along the river, many amenities already exist to support the water trail in this area.

More than 300,000 people use the Katy Trail each year. "Many communities along the Katy Trail have seen a resurgence due to tourism traffic," Blunt said. "The Lewis and Clark Water Trail is expected to have a similar effect on river towns."

Information will be available online in early June; visit [www.missouririverwatertrail.org] for updates on the water trail's progress.

AECI Named Wind Co-op of the Year

Associated Electric Cooperative Inc., Springfield, was named 2006 Wind Co-op of the Year by the National Rural Electric Cooperative Association and the U.S. Department of Energy.

AECI, nominated for the award by the Missouri Department of Natural Resources' Energy Center, was a key player in the development of what is expected to be more than 156 megawatts of wind energy in northwest Missouri. It was chosen over five other cooperative systems from across the nation by a panel of wind, utility and electric cooperative experts.

By making the initial commitment to purchase all of the energy produced by the Bluegrass Ridge wind farm in Gentry County, AECI gave wind energy developer Wind Capital Group the encouragement needed to proceed with two other wind farms in Missouri.



The utility intends to purchase the electricity from those wind farms, as well.

Bluegrass Ridge is expected to begin producing electricity this spring. The remaining two projects – in Atchison County and Nodaway County – are expected to begin producing electricity before the end of 2007. Iowa-based John Deere Wind Energy, a unit of agricultural equipment manufacturer Deere & Company, is financing the project.

Safe Disposal of CRT Waste; E-scrap

Cathode ray tubes are found in color computer monitors and televisions. When those computer monitors and televisions become obsolete, disposal of CRTs can be an issue. If handled



incorrectly, CRT recycling can produce hazardous wastes such as waste-lead-ed glass. In October 2001, the Environmental Protection Agency created rules for disposing of CRTs, stating that they must be brought to special recycling places.

The Missouri Department of Natural Resources recently certified the state's first electronics demanufacturer, in Springfield. Computer Recycling Center demanufactures more than 3.25 tons of electronic scrap a month; including monitors, televisions, computers, mice, keyboards, printers, scanners, speakers, cell phones and various other e-scrap items.

Computer Recycling Center currently recycles about 97 percent of its electronic scrap, but aims to recycle 100 percent of the scrap in the near future. Recovered CRT material can be reused in new electronics.

For more information on resource recovery certification, please contact Richard Hock at the Missouri Department of Natural Resources' Hazardous Waste Program at 1-800-361-4827 or by e-mail at richard.hock@dnr.mo.gov.

TIME EXPOSURES

Send your photo to "Time Exposures," c/o Missouri Resources, P.O. Box 176, Jefferson City, MO 65102-0176. All pictures will be returned via insured mail. Pre-1970 environmental and natural resource photos from Missouri will be considered. Please try to include the date and location of the picture, a brief description and any related historic details that might be of interest to our readers.



Missouri Valley Special Collections, Kansas City Mo. Public Library

A two-car, electric interurban train that ran east to Excelsior Springs is shown sitting at 13th and Walnut in Kansas City in 1915. The Kansas City, Clay County and St. Joseph Railway also ran two-car trains north to St. Joseph and included six farm stops on each leg of the line.

The KCCC&STJ, financed by shareholders in eastern states, ran for 20 years, between 1913 and 1933. Local highway improvements eventually reduced demand for the trains. The heavy electric cars, 58 feet long and 9 feet wide, were also known as the "Red Line" due to the steel coaches' reddish-maroon color.

While operating on city trolley tracks, powered by 600 volts, the trains traveled slowly. When on the 1,200-volt rural tracks, they could hit more than 70 mph. Leaving St. Joseph every hour from 5:30 a.m. to 11:30 p.m., passengers paid \$1.55 for the two-hour ride in a luxury car south to downtown Kansas City. The electric trains also hauled coal, wood, ice, mail and farm products faster than the three hours it took steam trains to make the trip.

The KCCC&STJ was one of several interurban lines developed primarily in the Midwest. At the peak of the trend, in 1916, these sootless, cinderless trains ran on 18,000 miles of track with 10,000 cars.

face water in exchange for financial incentives and technical assistance.

The program is a cooperative effort between landowners, public drinking water supply districts, the USDA Farm Services Agency, the Missouri Department of Conservation, the Missouri Department of Natural Resources, the USDA Natural Resources Conservation Service, the Missouri Association of Soil and Water Districts, the Missouri Department of Agriculture and University of Missouri-Extension.

The primary goal of CREP is to reduce the amount of pesticides and other chemicals that enter drinking water supplies of rural communities. By retiring cropland and adding vegetation buffers along waterways, a large amount of chemicals and sediment can be filtered out.

To determine if your land qualifies, contact your local FSA office. For more information, contact the Missouri Department of Natural Resources' Soil and Water Conservation Program at 1-800-361-4827 or (573) 751-4932.

Bird Watching Data on Web

The Missouri Department of Natural Resources and The Audubon Society



of Missouri have formed a partnership to help Missourians become more familiar with

birds through the State Parks Checklist Project (SPARKS). Through this program, ASM volunteers will collect bird data for state parks and historic sites and enter it into the ASM Bird Database checklist.

To access the SPARKS data online, go to [www.mostateparks.com/sparks.htm] or [www.mobirds.org].

For news releases on the Web, visit [www.dnr.mo.gov/newsrel/index.html]. For a complete listing of the department's upcoming meetings, hearings and events, visit the department's online calendar at [www.dnr.mo.gov/calendar/search.do].

Clean Water Effort Expanded

Missouri recently amended its original Conservation Reserve Enhancement Program to add eligible acres to preserve drinking water supplies.

The voluntary program, initially approved in 2000, is designed to encourage agricultural landowners to help protect environmentally sensitive land, decrease erosion, restore wildlife habitat and safeguard ground and sur-

Arnold Stream Team #211 Meramec River Defenders

Since 1991, Arnold Stream Team #211 has been committed to the protection of the Meramec River Basin and its tributaries. The team has 422 active adult members participating in activities in the Meramec River Basin.

Since 1996, members of Arnold Stream Team #211 have spent:

- 16,600 hours cleaning streams
- 3,561 hours meeting with new members and planning stream conservation events
- 907 hours working with other agencies on stream projects
- 811 hours going to workshops and training new members
- 431 hours writing articles about their activities and recruiting new members
- 332 hours conducting water quality monitoring
- 269 hours planting trees to improve streambank protection for streams within the Meramec River Basin
- 78 hours conducting watershed inventories of the Meramec River and its tributaries

Over the years, stream team volunteers have removed many tons of trash from the Meramec River and its tributaries. Due to monitoring and scheduled cleanups, trash is usually collected before it can impact the streams; tires are removed before they become sediment traps; and polluters are educated about the benefits of protecting Meramec River water quality. The Arnold Stream Team has set a high standard for stewardship and excellence.



Arnold Stream Team

Photo by Darlene Haun

"The Arnold Stream Team has created a true partnership between stream team members, governments and businesses within the watershed," said Priscilla Stotts, volunteer water quality monitor and Missouri Stream Team coordinator for the Missouri Department of Natural Resources. "The team has provided a means for many agencies to work together for the benefit of all and stop the degradation of these Missouri streams."

The Arnold Stream Team has served as a model for potential partnerships between community groups and local officials. Stormwater control planners in Arnold and Jefferson County have called upon the Arnold Stream Team to assist with educational outreach efforts. The team also has worked closely with the City of Arnold to reduce local illegal dumping.

"The City of Arnold has been one of the best supporters of our goal, trying to rid the Meramec River and adjacent flood plains and tributaries of trash that has accumulated over the years," said Bernie Arnold, co-chair of the Arnold Stream Team. "With the city's cooperation, our team has accomplished some major cleanups that other teams would envy."

The Missouri Stream Team program currently includes 3,130 stream teams with about 60,000 members. The Missouri Department of Natural Resources, Department of Conservation and the Conservation Federation of Missouri sponsor the program.

Kansas City WildLands Connecting People to Nature

To protect, conserve and restore the natural areas of the Kansas City region, by promoting community stewardship of the land, is the mission of the Kansas City WildLands, an affiliate of the Kansas City environmental organization Bridging The Gap. KCWL includes resource professionals, private conservation organizations and conservation-minded citizens and was established to restore and manage the remnants of Kansas City's original landscape.



Photo by Dylan Lehrbaum

KCWL's Susan Appel and daughter, Chloe

More than 2,200 KCWL volunteers have performed restoration on 13 native plant communities within the Greater Kansas City area, providing more than 13,000 hours of time since 2002. The KCWL coalition recruits volunteers to help restore these native communities and equally important, educates the public on the importance of these restoration projects. As a result, native vegetation is returning to Kansas City's natural areas.

Over time, natural plant communities in these areas have been overrun by trees and brush, invaded by non-native plants, such as Japanese honeysuckle, and are deprived of the natural processes that once maintained them. The work in these areas focuses on removing invasive plant species, collecting native species seeds and planting native species. Volunteers learn about non-native species.

Kansas City WildLands hosts four community workdays at three to five sites each year. More than 800 people, as individuals or in groups, volunteer annually. The coalition also hosts numerous individual workdays, which involve college, school, scouting or other groups wanting to work on a specific project or site. In 2006, KCWL organized 36 community and individual workdays.

Each workday includes a hike and educational activities. The KCWL coalition believes it is critical to educate the public living in urban settings about the importance of and reasons for their work. Larry Rizzo, natural history biologist for the Missouri Department of Conservation and the founder of KCWL, says, "The work of Kansas City WildLands goes beyond restoring Kansas City's best remaining natural plant communities. We want to reconnect people to these lands in a meaningful way, to create advocates and through hands-on stewardship, give people a personal investment in these special places that will hopefully (survive) for future generations."

In addition to the workdays, KCWL performs a periodic "BioBlitz" in some areas. In a 24-hour time span, biologists do a hit-and-run survey on a piece of land. They observe and document every different species there and see if previous work efforts are returning new plants and species to that natural community.

The KCWL recently received two awards for their efforts: the Jackson County Operations Services Award and the Speas Foundation Award from the Kansas City Volunteer Coordinators' Council, a support group for area volunteers and their managers. KCWL's activities also have been incorporated into the curricula at Rockhurst University, University of Missouri-Kansas City and William Jewell College. For more information about KCWL, visit their Web site at [www.kcwildlands.org].

Lake Wappapello State Park

Celebrating 50 Years of Hidden Fun

by Jennifer Sieg

A relaxing hideaway awaits you in southeast Missouri. With quiet forested hillsides, lakeshores for fishing and swimming and superb sunsets, Lake Wappapello State Park near Williamsville is the ideal vacation destination. Tucked away in an assembly of public lands, this state park has been one of southeast Missouri's best kept secrets for 50 years.

Long before the state park existed, North American Indian Tribes, including the Shawnee, Cherokee, Osage and Delaware, inhabited the area, followed by pioneer settlers that farmed, logged and mined iron on the land. The Allison family owned the land that now encompasses the park from after the Civil War until the early 20th century. In 1938, the U.S. Army Corps of Engineers began construction of a dam to control flooding on the St. Francis River, creat-





DNR photo by Scott Myers



Photo by George Denniston

ing the Wappapello Lake Project. In 1957, the state began developing 1,854 acres along the lake, leased from the Corps of Engineers, establishing the state park.

Today, the park serves as an excellent access point for the 8,400-acre Lake Wappapello. Use of the park's three boat ramps is free, providing easy entry onto the lake for boating, fishing or skiing. Bring your own boat or seek rental from one of the many nearby marinas. Fishing can be successful from a boat or from the shoreline for white bass, crappie, sunfish, largemouth bass and catfish. Several fishing tournaments are held on the lake each year. For those who prefer to play in the water, the park's swimming beach is free and open from Memorial Day through Labor Day.

The park, however, is not all about the lake. Twenty-seven miles of trails, ranging from a half-mile stroll to a 15-mile adventure, will help you explore the natural features ashore. Trees characteristic of the southern Ozark plains and the southeastern coastal plains, including oak, hickory, red buckeye, beech, shortleaf pine and tulip, are dispersed on the park's valleys and chert hillsides. Beneath the trees in shaded areas grow ferns and orchids, while birds-foot violets and pussy's toes thrive on the sunny slopes. Mistletoe, which grows in the black gum trees and sycamores along the edge of the lake, is a special feature rarely found in Missouri.

Although most of the park's trails are for hiking only, Lake Wappapello Trail is a 15-mile hiking, backpacking, all-terrain bicycle and equestrian trail, which traverses var-

ied and rugged Ozark terrain. It was developed through cooperative efforts of the Department of Natural Resources, the U.S. Army Corp of Engineers, the University of Missouri and a private landowner. It connects to the Ozark Trail providing access to 100 miles of equestrian trail.

Other trails in the park lead to superb views of the lake, the Allison family cemetery and the Asher Creek waterfowl refuge, where eagles, ospreys and duck species can be spotted in the winter, while great blue herons, songbirds, barred and great horned owls and geese call it home year-round. Additional wildlife that you may see include deer, armadillos, hummingbirds, squirrels, raccoons and a variety of lizards and snakes, including the "canebrake" subspecies of the timber rattlesnake.

(Opposite page) Fall color surrounds the 8,400-acre Wappapello Lake Project.

(Far left) The park contains two campgrounds, one nestled near the lakeshore and one high on a ridge. Both cater to tent and recreational vehicle campers.

(Left) With its three bedrooms and secluded location, cabin #8 is a favorite of park guests.

(Below) The park's three boat ramps provide fishermen easy access to their favorite cove.



Photo by George Denniston



Surrounded by public lands, Lake Wappapello's natural beauty remains unspoiled from nearly any viewpoint.

DNR photo by Scott Myers



Photo by George Denniston

(Above) Lake Wappapello Trail features 15 miles of scenic trail for hikers, mountain bikers and equestrians. For longer hikes or rides, the park trail connects with the Ozark Trail.

(Below) Alex Thrasher and Ruth Poland, college students at Washington University in St. Louis, pick up park information and check out items for sale in the park office.



DNR photo by Scott Myers

To learn more about the park's natural features without hitting the trails, you can attend one of the park's nature programs during the summer months and visit the small Nature Discovery Room near the park office. Some of the naturalist's programs are held in conjunction with other events going on at the lake, including the annual Fourth of July festivities, Army Birthday event, kid's fishing derby and speed boat races.

With so much to do, extend your stay at the park to more than a day. Eight cozy cabins offer kitchenettes, heat and air conditioning, linens, a television and a fire ring and grill. Seven of the cabins are two bedroom and sleep up to six people, while one cabin is perfect for larger or multiple families as it has three bedrooms and sleeps up to 10 people. The cabins are available between April 1 and Nov. 15.

If you prefer to "rough it" and sleep in the outdoors, the park offers two campgrounds, Ridge and Asher Creek, offering a total of 71 electric campsites and four basic sites, with four sites accessible to people with disabilities. Asher Creek Campground features campsites near the water's edge, while Ridge Campground offers well-shaded campsites perched above the lake. The campgrounds feature showerhouses, laundry facilities, a dump station, and firewood and ice sales. A small store in the park of-

fice offers a few supplies. Some campsites are available year-round, making the park a perfect hunter's camp or the location of a peaceful winter getaway. Although there is no hunting in the state park, groups of hunters fre-

quent the wintertime campground to hunt on nearby public lands.

For those of you who aren't quite ready for the total camping experience, four new camper cabins are now available and offer a near-camping experience. Located in the Ridge Campground, these cabins offer electricity, heat and air conditioning and sleep up to six. They do not have running water. For water, the campground showerhouse is available April 1 through Oct. 31. The camper cabins are available year-round.

The cabins, camper cabins and most campsites can be reserved up to six months in advance by calling 1-877-422-6766 or online at www.mostateparks.com.

If a day is all that you have to spare, the park offers three picnic areas and playgrounds to enjoy between other activities. Two picnic shelters, which can accommodate 50 or 75 people, can be reserved for large family gatherings by calling the park office. They offer picnic tables and outdoor grills and one is accessible to people with disabilities.

One of the best features of this park is that it is seldom crowded. So, if you're planning your next getaway with family or friends or a visit to the area to attend or participate in an event on the lake, make Lake Wappapello State Park the headquarters for your outdoor escape.

Lake Wappapello State Park is located 18 miles north of Poplar Bluff, eight miles east of Highway 67 on Highway 172. Contact the park for more information at (573) 297-3232 or the Missouri Department of Natural Resources toll free at 1-800-334-6946 (voice) or 1-800-379-2419 (Telecommunications Device for the Deaf) or visit the Web at [www.mostateparks.com].

Jennifer Sieg is a public information specialist with the department's Division of State Parks.

Natural Resource Boards Want You!



DNR photos by Scott Myers

by Philip J. Tremblay

Protecting Missouri's natural resources is a task that has the support of the state's general assembly, the governor's office, various state agencies and most state taxpayers. However, when the Department of Natural Resources must focus on the often controversial details of resource protection and the challenge of applying environmental laws, rules and regulations fairly, an army of citizen volunteers is called in.

These volunteers, many serving as the governor's appointees and most working long hours without pay, serve on the department's boards, commissions, councils and committees. They are a vital link between public expectations and state government's ability to deliver on promises that Missouri's natural resources are to be utilized and enjoyed – today and into the future.

Most boards, commissions, councils and committees are empowered by state law. Others were created and charged with their duties through state and federal cooperation. One or two owe their existence to a governor's executive order. In some cases, a committee is formed to deal with a specific crisis or question, then later expanded to address other concerns within that area of expertise. An emergency task force or subcommittee

designated to deal with a short-term problem may also have a short lifespan.

The boards, commissions, councils and committees working with the Department of Natural Resources are now listed in a directory. Online copies are available at [www.dnr.mo.gov/pubs/pub2180.pdf]. Department staff serve as points of contact for these groups. The department director also serves as a member on multi-state or regional commissions or committees.

There are currently 32 boards, commissions, councils and committees involved with the department. Nearly 200 volunteers serve on them. In most cases, state law defines how many persons are appointed to serve by the governor, how many may represent each major political party, what geographical part of the state or senate districts must be represented or what special interests – agricultural, industrial, labor or business – must be included. Members are usually compensated for mileage and direct expenses related to serving. A few are paid a limited per diem while working on behalf of the board. All boards, commissions, councils and committees have specific differences.

For example: The seven members of the Air Conservation Commission must include

David Shorr, representing the Central Missouri Development Council, makes his presentation to the Missouri Clean Water Commission. From left, Jan C. Tupper, commissioner; Thomas A. Hermann, chairman; Edward Galbraith, Department of Natural Resources water protection director; Mary Bryan, commission counsel; and Malinda Overhoff, secretary.



DNR photo by Scott Myers

(Above) A meeting of the Missouri Safe Drinking Water Commission includes: from left, Susan Hazelwood, commissioner; Randy Moore, commissioner; Elizabeth Grove, commissioner; Linda McCarty, Natural Resources staff; and John Witherspoon, commissioner. (Right) In June 2006, members of the Safe Drinking Water Commission met with federal agency staff to review a watershed protection project near Big Lake State Park. Pictured, from left, are Elizabeth Brown, Howard County, commission chair; Bruce Biermann, area one director for the Missouri Association of Soil and Water Conservation Districts, Holt County Soil and Water Conservation District; and Grover D. DePriest, resource conservationist with the USDA's Natural Resources Conservation Service in Holt County.

no more than four members of one political party. All members must represent the general public interest and have an interest in and knowledge of conservation and the management of air contaminants. One member must represent agriculture, one must represent industry and another must represent labor interests.

The Air Conservation Commission must meet at least nine times within a year. The Clean Water Commission must have at least six meetings a year and the Missouri State Park Advisory Board must have at least one meeting per year – they usually meet four times. The Safe Drinking Water Commission meets four times per year, but its membership isn't confined by political or geographical affiliation requirements.

One commission may have power to adopt rules, set environmental quality standards, require testing, issue orders, call for investigations or contract for technical services. Another might adopt regulations and policies to carry out the objectives of law, hear appeals of permits or decisions by department staff or direct the use of state grant and loan funds.

Advisory boards serve some of the department's efforts. These groups do not establish rules, regulations or hold hearings or appeals, but they serve as the department's eyes and ears regarding how appropriately state law is being used to attain the goals desired by state citizens and special interest groups.

Becoming involved in scheduled meetings is one way an individual may show interest in serving on one of the department's boards, commissions, councils and committees. A meeting calendar can be found at



DNR file photo

[www.dnr.mo.gov/calendar/search.do]. Involvement in a business or industry's discussions with the department on land, air and water issues or providing an activist's viewpoint at such meetings may also prepare people for this public service.

To apply for a board or commission appointment, print and complete the application forms found at [www.gov.mo.gov/boards/BoardsApp.pdf].

The completed appointment application and release forms must be mailed to: Office of the Governor, Room 216, State Capitol Building, Jefferson City, MO 65101. You may also fax the release forms to (573) 751-1495.

Philip J. Tremblay is a public information coordinator for the department and assistant editor of Missouri Resources.

Watching the Waters

Monitoring Supply to Meet Demand

By Larry Archer



Typically, talk of the weather sustains a conversation that has nothing more interesting to keep it going. For Steve McIntosh, weather talk – especially during dry times – is his job.

McIntosh, who works in the Department of Natural Resources Water Resources Center, coordinates the center's tracking of drought in Missouri, an important element of the center's overall mission of making sure decision-makers know whether the state has enough water to meet its demands.

Gov. Matt Blunt, recognizing the importance of meeting water needs, dedicated \$1.6 million in fiscal year 2007 for water assessment and monitoring. He also established the Interdepartmental Coordination Council for Water Quality, which the department chairs.

"Right now there's a lot of interest in water planning," said Ryan Mueller, Water Resources Center director. "And good planning is driven by an accurate assessment of available water resources and current and future needs."

In addition to keeping an eye skyward, tracking the state's water supply includes watching groundwater and surface water levels, water usage and competition for interstate water

Scotty Baumgartner, a hydrologist with the Department of Natural Resources Water Resources Center, installs an antenna at a well monitoring site near Columbia. The antenna allows the center to see real-time data on water levels at the site. DNR photo by Jim Vandike.

resources. To improve ground and surface water assessments, the center and the U.S. Geological Survey are adding additional groundwater observation wells and stream gauges to measure water levels in aquifers, lakes, streams and rivers.

"By fiscal year 2009 we'll have 110 additional monitoring sites throughout the state – 80 groundwater level observation wells and 30 stream gauges," Mueller said.

With the flip side of supply being demand, the state's 2,260 registered major water users are required to report their water usage. About half currently do so.

"Between 55 percent and 60 percent of registered major water users report their water usage," Mueller said. "With those numbers, it's difficult to make meaningful assessments," he added.

Not all of Missouri's water resources come from the ground or fall from the sky. The Missouri River, which flows to Missouri from the west, provides more than half of the state's drinking water, and provides water for transportation and power. The center represents Missouri when river management conflicts arise with other states (see "Missouri

Water in High Demand," Missouri Resources, Winter 2006).

While much of the center's staff assess water quantity issues, its dam safety section makes sure that the same water doesn't destroy property or take lives by making sure regulated dams meet safety standards.

Regardless of its source, Missouri's water supports all of us, and the department's Water Resources Center works to account for the state's water use and needs.

Larry Archer is a public information coordinator with the department's Field Services Division.



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